

# Oral Health Epidemiological Survey as a Didactic-Pedagogical Resource in the Clinical Epidemiology Education of Dental Surgeons

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## ABSTRACT

This study aimed to report the use of an epidemiological survey on oral health as a didactic-pedagogical resource in the initial education of dental surgeons. Following the objectives of the external supervised internship of the Dentistry undergraduate course at the State University of Ponta Grossa, students have developed epidemiological surveys on oral illnesses and/or needs in cooperation with Oral Health Teams. These surveys focus mainly on dental caries, oral cancer and dental prosthesis according to life cycles, in several social spaces such as child daycare centers, schools, education teams in health units, among others. Carrying out epidemiological surveys, in addition to providing students with opportunities of acting as executors, also enables them to associate theoretical content from the collective health axis to the development of Primary Health Care. It provides a model of situational strategic planning from the data collected to monitor oral diseases along the years in specific groups and results in feedback for the services provided and for the community through reports, education activities as well as new strategies and demand organization, and it might also achieve other objectives. The focus of this report was to highlight the use of surveys to learn about individual and community clinical diagnoses, enabling certain aspects of the course clinical axis such as the differentiation of anatomical characteristics of deciduous and permanent teeth, differential diagnosis of white-spot dental lesions, less frequent dental or soft tissue alterations and/or lesions, among others. Due to their applicability beyond the collective health teaching, oral health epidemiological surveys have been seen as a promising didactic-pedagogical resource in the clinical epidemiology education of dental surgeons and their use should be fostered in dentistry courses.

**Descriptors:** Health Surveys. Teaching Care Integration Services. Teaching Materials. Professional Training. Dentistry.

## 1 INTRODUCTION

Epidemiological surveys on oral health have been largely used to evaluate oral conditions in specific populations, both at the local and global levels. The main purposes of these surveys is to determine the current situation and monitor disease patterns or events related to oral health, enabling comparisons between populations and they can be used as input for the planning of public policies, and evaluation of the effects of health measures<sup>1,2</sup>.

Several oral conditions can be evaluated by means of epidemiological surveys. These include crown or root dental caries, need for caries or periodontal disease treatment, use or need for dental prosthesis, dental malocclusion and fluorosis, among others<sup>1,3</sup>. The choice of oral conditions to be measured and the indices and indicators mainly result from the epidemiology according to the life cycle<sup>1,4</sup>. However, methodological alterations might be carried out to achieve specific objectives such as extension of the age range studied or the place of data collection, or even, their objective, including, for example screening, and need and/or demand organization<sup>4,5</sup>.

Community (epidemiological) and clinical diagnoses present differences and particularities that have to be highlighted. Clinical diagnosis is used to detect pathologies in individuals and is supported by several resources. Its main aim is the treatment plan for the patient under evaluation<sup>1,6</sup>. Community diagnoses, in turn, despite being operated from an individual approach, aim at identifying the occurrence and distribution of oral pathologies in a specific population from the data collected and inform the planning and execution of oral health actions based on individual and collective approaches<sup>1,3,7</sup>. For this reason, diagnostic resources at the community level must be feasible, reproducible and present low cost<sup>3,7</sup>.

In Brazil, there has been a considerable expansion of the offer of dental services in the public health sector in the last few years. However, an overlapping among the different models of health care has been observed, mainly between the hegemonic (biomedical) and the counter-hegemonic ('sanitary') model. While the former establishes the individual practice centered on the professional and the clinic, dealing with diseases through diagnosis, cure and rehabilitation, the latter is based on the epidemiological practice, acting in the prevention of illnesses and health promotion as a way to provide health assistance<sup>7</sup>.

Health Primary Care (HPC), mainly in the model of the *Estratégia Saúde da Família -ESF* (Family Health Strategy – FHS) has been a way of acting in a counter-hegemonic model<sup>7</sup>. Not only is the HPC the first level of health care, it also coordinates the assistance provided by different sectors and carries out shared actions within certain territories. In this sense, providing continuous and longitudinal care to a specific population becomes fundamental for the action plan<sup>8</sup>, being epidemiological surveys indispensable<sup>1</sup>.

The oral health teams (OHT) in the *Sistema Único de Saúde –SUS* (Brazilian Unified Health System), include few professionals that work on, and are in charge of greater populational demands when compared to the medical teams, which generates some unbalance between the SUS installed capacity and proper work in the individual and collective fields<sup>9</sup>.

In the last few years, the country has intensified the articulation of teaching-service-community, mainly in relation to the HPC services, aiming to meet the requirements of the National Curriculum Guidelines for Dentistry undergraduate courses, with the purpose of providing a generalist professional education that is able to respond to the population health needs

in the logic of the current health system, that is, the SUS<sup>10</sup>. Therefore, the HPC became a place of learning that receives human resources coming from higher education institutions.

Although the teaching related to the use of oral health epidemiological surveys is a routine in the subjects of the collective health axis, mainly in external supervised internships, in most dentistry undergraduate courses in Brazil this practice is traditionally realized to the teaching of the epidemiological techniques involved in this process<sup>10-13</sup>.

The importance of epidemiological surveys as a means of providing community health diagnosis and as a fundamental tool for the development of the SUS service is already well-established. Therefore, the involvement of dentistry students in this practice, in addition to benefitting directly the service and the epidemiology learning, when well-planned might become a vital tool in the clinical axis teaching in dentistry<sup>11</sup>.

In this context, the objective of this study was to report the use of epidemiological surveys on oral health as a didactic-pedagogical resource in the clinical epidemiology initial education of dental surgeons.

## 2 EXPERIENCE REPORT

The report covers part of the work developed in the dentistry undergraduate course of the State University of Ponta Grossa, Brazil. In the course political pedagogical project, which is in force since 2016, the subjects related to collective oral health (collective health I and II) are taught in the second year. These subjects are distributed in a theoretical semester and an external supervised internship semester. During the internship, with a total workload of 51 hours, the students are immersed in the municipal oral health care network, and are introduced to health services according to hierarchical levels and the execution

of activities in cooperation with the FHS at the HPC unit.

The pedagogical proposal guiding the teaching-learning process in the external supervised internship subject includes the following categories: alignment of the students' theoretical conceptions, objective conditions in the field work with the development of significant practices in collective health, and a creative education praxis towards emancipatory teaching. In the field of theoretical resources, the training for a rupture of technician and pragmatic modes of action and the reinforcement of humanization practices prevails. The contents of health planning and the principles of the SUS work process complete the context of teaching, service and community integration<sup>13,14</sup>.

In this sense, even if traditional organization divisions are initially observed, in which the professors guide the reflection on health issues, as soon as the students take their positions in the internship sites, the active role of the subject learned starts to be shared between them, their professors and the community, making the internship an experience that is at the same time open and directed.

Significant academic practices are guided to the activities of health prevention and promotion, without a direct assistance character, that is, individual clinical activities at the health unit. From 2017 onwards, the internship subject included the development of intervention projects (IP) per health units, aiming at strengthening interinstitutional bonds. These IP are elaborated in a cooperative way involving students, professors and the health teams, considering the internship local reality and the implementation governability and logistics<sup>14</sup>.

Considering the said intervention projects, but not limited to them, the oral health epidemiological surveys carried out by the collective health subjects have been experienced

as an important didactic-pedagogical resource in the dentistry undergraduate course. Therefore, several epidemiological surveys are applied according to the needs expressed by the oral health teams, within different social spaces in the territory such as *Centros Municipais de Educação Infantil - CMEI* (Municipal Child Daycare Centers) and schools, at the Basic Health Unit (BHU), in cooperation with education groups such as pregnant women, elderly, and group of hypertensive and diabetic

patients (HIPERDIA).

Also, bearing in mind the local reality, surveys on the main dental diseases and/or needs according to the age range of the groups under evaluation are included, following the epidemiology, and the World Health Organization (WHO) criteria and indices<sup>15</sup> or adapted and simplified versions, since the cases are referred to the health unit, which is the place with better resources for a more precise diagnosis (figure 1).

Group	Index or Indicator	Activity
Pre-school children	Dmft	Educational activity Report to the CMEI Report to the BHU/FHU Referral to the BHU/FHU
School children	dmft or DMFT	Educational activity Report to the school Report to the BHU/FHU Referral to the BHU/FHU
Pregnant women	DMFT	Educational activity Referral to the BHU/FHU
HIPERDIA or Elderly	Need for dental prosthesis Oral cancer	Educational activity Referral to the BHU/FHU

Figure 1. Indices and activities developed according to the life cycles or education groups

HIPERDIA: group of hypertensive and diabetic patients. dmft: decayed, missing and filled deciduous teeth. DMFT: Decayed, missing and filled permanent teeth. CMEI: *Centros Municipais de Educação Infantil* (Municipal Child Daycare Centers). BHU: Basic Health Unit. FHU: Family Health Unit.

The choice of indicators and/or indices to evaluate the occurrence and/or distribution of oral diseases in the epidemiological surveys carried out depend on the purpose/objective and the specificities of each IP. However, in all cases, feedback is provided through educational and/or preventive actions determined in cooperation by professors, students and the health teams. When defining the IP, a strategic plan is developed considering the existing problems in the territories where the internship occurs. The aim of such

planning is not only to know the diseased and healthy subjects, but rather to establish the main oral health needs in the population under analysis and to organize the demand.

In addition, every IP has a process evaluation phase and includes feedback aspects as previously mentioned, either directly to the participating individual, as for example, referring patients with dental needs, preparing and delivering educational activities to vulnerable groups; or to the partner institutions, through reports to the services

involved such as child daycare centers, schools and health units.

### 3 DISCUSSION

This report aimed to demonstrate the successful experience of applying epidemiological surveys with broader purposes that include initial education in dentistry undergraduate courses during the external supervised internship. In this sense, their use as a didactic-pedagogical resource was not limited to teaching in the collective health axis, but also in the clinical axis, that is, aiming at the clinical-epidemiological training of the dental surgeon.

Surveys can be used to optimize the space of interaction between teaching-service-community and thus contribute to the future dentists' professional and interprofessional improvement<sup>16</sup>, along with an academic education aligned to the health service needs<sup>10</sup>. Although this report is linked to the external mandatory internship program, it seems relevant to emphasize that these surveys can be carried out independently on other suitable occasions or in other subjects. However, regardless of their purpose or objective, additional care is required in relation to the inclusion of feedback actions<sup>17</sup>, for example, referral of the patients with dental needs, execution of education activities to vulnerable groups and report to the services involved. The data collected becomes a fundamental tool in the health surveillance strategy<sup>4</sup> and constitutes indispensable information for the planning of health actions. Therefore, previous agreements must be established regarding the responsibilities of the actors involved, for example, referral to the SUS and/or university clinics.

Epidemiological surveys are a collective diagnosis method that goes beyond an isolated view from a case-by-case basis to a broader epidemiological view<sup>3,7</sup>. The logic of the oral health evaluation outside the clinic in higher

education institutions gains a relevant professional value, because it creates a moment of concretization of knowledge on planning. This phase goes from the quest for inter-sector articulation or with health services, the choice of priority groups, the choice of indicators or indices to be used, up to the point of obtaining human, financial, material and/or structural resources that might be needed for their execution<sup>18</sup>.

As in the higher education institution under analysis the Political Pedagogical Plan in the collective health field is divided into a theoretical semester and another semester of external internship in primary care, we believe that to establish good quality theoretical-practical knowledge during the development of the epidemiological surveys a movement from theory into practice occurs<sup>14</sup>. Learning through practical activities broadens knowledge acquisition and the students' interest. These activities have been shown more efficient when compared to more traditional methodologies, which tend to be limited to the cognitive level. The practical actions to be carried out require previous knowledge of the subject and, therefore, the experience becomes more profitable and significant<sup>19</sup>.

Traditional teaching approaches or the fragmented teaching of the subjects in the collective health and clinical axes still represent a barrier in the health professional initial education. The use of active methodologies is a viable alternative that enables better theoretical-practical assimilation of the contents proposed and might fill in the existing gap between teaching and learning<sup>20</sup>. The facilitating way of teaching allows the students to acquire practical knowledge in specific environments and reinforces the theoretical background acquired in the classroom. Moreover, greater interaction occurs between teaching, service and community<sup>10-13</sup>. Greater possibility of content assimilation by the students is also created along with the full construction of the health

professional development process, therefore, the courses become more responsive to the society most diverse demands for providing full training<sup>20</sup>.

To demonstrate the implications in the clinical axis, we could mention the differentiation between deciduous and permanent teeth, for example. Within the school child population, the hybrid uses of decayed, missing and filled deciduous (dmft) and permanent (DMFT) indexes simultaneously might be required<sup>21</sup>. During the time the epidemiological survey was developed, the broad observation of a large number of people in a short period of time, enabled the students to notice the differences between the anatomy of deciduous and permanent teeth. In a routine situation, inside the higher education institution, the individual clinical dental care would limit the contact with one or two patients per period, which might also limit the observation of teeth in different age groups on the same day and a limited number at the end of the semester. Although the diverse anatomical characteristics are already known by the students, they already find it difficult to differ deciduous from permanent teeth, mainly in the mixed dentition phase. The contact with a larger number of school children with mixed dentition in different stages of tooth eruption represents an advantage of the use of this active learning methodology, which aims to articulate theory and practice in the teaching-learning process<sup>22</sup>.

While the proportion of caries-free children and adolescents increases in Brazil and worldwide<sup>2</sup>, and consequently the ceo-d and CPO-D indices decrease<sup>23</sup>, the evaluation of dental tissue alterations with clinical characteristics similar to those of the dental caries becomes more frequent. Epidemiological surveys might be also used as a resource to teach the differential diagnosis of white spots such as hypoplasia, molar-incisor hypomineralization (MIH), and fluorosis. According to Jälevik, Szigyarto-Matei and Robertson (2019)<sup>24</sup>, trained professionals show

greater capacity to differentiate alterations in the development of dental caries lesions in the enamel when compared to professionals without previous training.

In addition to the alterations or abnormalities in dental structures, routine surveys create the possibility of visualizing oral pathologies and alterations that are less frequent in the university clinical routine, but that are highly prevalent in the population. Some examples are: ankyloglossia, migratory glossitis, supernumerary teeth, morsicatio buccarum, labial frenum low insertion, mucocele, ranula, fistulae, among others<sup>25,26</sup>. In such cases, the need for continuous ethical and professional responsibility when rendering dental services is reinforced, both inside the higher education institution and mainly in social spaces of interaction with other health services.

This report evidenced that epidemiological surveys must be developed with several purposes that go beyond dental caries evaluation in school children as traditionally carried out in Brazil<sup>27</sup>. Despite the wide use of dmft and DMFT indices, gingival alteration index and the oral hygiene index (OHI), they might show low applicability in some age groups or even be unsuitable in some cases. Therefore, they might require adaptation or simplification, since the articulation with other health services might guarantee an individual clinical diagnosis posteriorly. Also, other indicators or indices might be applied to the oral health action plan within the territory under analysis according to the characteristics of the target population<sup>28</sup>.

Teaching health planning and management skills and competences in dentistry undergraduate courses provides students with some experience in the oral health professional work, both in the clinical activity and in the management of health actions by the dental team. In addition, sharing the physical environment and interacting with the SUS users contributes to the education of a critical and

self-evaluating professional<sup>29</sup>. The education of a professional with problem-solving management skills and that is able to work in multi-professional teams depends on quality training that provides the interaction between teaching-service-community<sup>23,30</sup>.

The lack of studies dedicated to the use of oral health epidemiological surveys as a didactic-pedagogic resource in dentistry undergraduate courses represents a limitation for comparison with this study, showing that this theme is still poorly explored<sup>11,12</sup>. Also, experience report is subjective in relation to the knowledge and learning of the institution specific participants and, therefore, might present a different use or nature in other realities. Adaptations regarding the issues exposed in this report might be necessary to cater for the educational objectives of each institution and for the process of improvement and development of learning strategies that, as a consequence, contribute to strengthen the teaching-service-community relationship.

This report also revealed that the execution of an epidemiological survey in a well-designed and articulated way with health services in social spaces might result in benefits for all those involved. Regarding service, it helps the health situational diagnosis and the determination of vulnerable groups and assistance priority criteria; as for the community, it results in a more qualified and responsive action according to the local needs, including the optimization of the access and welcoming to the health services. As regards teaching, as described in the focus of this report, the use of epidemiological surveys is seen as a teaching-learning resource that goes beyond collective health theoretical teaching and, more specifically, epidemiology teaching, and it also becomes a rich opportunity for the teaching of the subjects in the clinical axis of the dentistry course such as cariology, periodontics, stomatology, and prosthodontics among other dental specialties.

#### 4 FINAL CONSIDERATIONS

This report showed how the teaching-service-community integration in the external supervised internship subject has favored the use of epidemiological surveys with purposes that go beyond teaching epidemiology, and that also make the teaching in the clinical axis easier. Thus, in addition to learning about the operationalization of a community diagnosis, planning and demand organization, students are also exposed to some training in the clinical axis such as the differentiation of deciduous and permanent teeth, dental structure differential diagnosis, as in the case of white spots, or the identification of dental and/or soft tissue alterations, among others.

Bearing that in mind, epidemiological surveys become a resource that enables the institutions to meet the requirements of the National Curriculum Guidelines, especially when there is a suitable organization of the activities to be developed in articulation with other health services. The report demonstrates that the activity proposed can be used as a promising didactic-pedagogical tool to favor the integration of collective health and clinical axes in the pursuit of generalist education aiming at a professional profile that masters the clinical-epidemiological logic.

Therefore, the supervised internship contributes to the education of an ethical generalist professional with a critical view of health as a service to the whole population. The process is developed from the initial phase of discussion of the existing problems, evaluation of feasibility, up to the strategy execution followed by feedback to the population through the presentation of proposed actions in health planning.

#### RESUMO

**Levantamento epidemiológico em saúde bucal como recurso didático-pedagógico na formação clínico-epidemiológica do cirurgião-**

## dentista

O objetivo do estudo foi relatar o uso do levantamento epidemiológico em saúde bucal como recurso didático-pedagógico na formação clínico-epidemiológica do cirurgião-dentista. Dentro dos objetivos do estágio supervisionado extramuros do Curso de Odontologia da Universidade Estadual de Ponta Grossa, os acadêmicos têm desenvolvido conjuntamente com as Equipes de Saúde Bucal levantamentos epidemiológicos de doenças e/ou necessidades bucais, principalmente para cárie dental, câncer bucal e prótese dentária, segundo o ciclo de vida, em diversos espaços sociais, como os centros de educação infantil, escolas, grupos educativos das Unidades de Saúde, dentre outros. A realização de levantamentos epidemiológicos além de oportunizar os acadêmicos como membros executores e na associação do conteúdo teórico do eixo de Saúde Coletiva na vivência da Atenção Primária à Saúde, como forma de planejamento estratégico situacional a partir dos dados coletados, no monitoramento dos agravos bucais ao longo dos anos em grupos específicos, e na realização de devolutivas para os serviços e para a comunidade, por meio de relatórios, atividades educativas e encaminhamentos e organização da demanda, pode atingir outros objetivos. O foco do relato foi destacar o uso dos levantamentos para aprender sobre o diagnóstico clínico individual e comunitário, e possibilitar aspectos do eixo clínico do curso, como diferenciação das características anatômicas de dentes decíduos e permanentes, diagnóstico diferencial sobre lesões dentárias de mancha branca, alterações e/ou lesões dentárias ou de tecidos moles menos frequentes, dentre outros. Diante sua grande aplicabilidade para além do ensino em Saúde Coletiva, o levantamento epidemiológico em saúde bucal tem sido um recurso didático-pedagógico promissor na formação clínico-epidemiológica do cirurgião-dentista, e sua realização deve ser incentivada nos cursos de Odontologia.

**Descritores:** Inquéritos Epidemiológicos. Serviços de Integração Docente-Assistencial. Materiais de Ensino. Capacitação Profissional.

Odontologia.

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